

ABSTRACT

An active balun circuit is provided for single-ended to differential RF signal conversion with enhanced common-mode rejection which suppresses common mode signal and which achieves phase and amplitude balance without sophisticated tuning or compensation methods. The circuit has a single-ended input and balanced output with phase and amplitude balance error less than 2° and 1.2dB, respectively, measured from 1.5GHz to 1.8GHz at 5V supply. When supply voltage drops down to 1.5V, its phase and amplitude balance error remains within 5° and 2dB, respectively. The circuit achieves a balanced output via an output network which behaves as an impedance matching network for differential mode signal and is grounded for common mode signal. As a result, common mode signal is suppressed and 180-degree phase balance at output is achieved. The circuit has high-linearity ($P1dB_m=5dBm$, $IIP3=16.6dBm$) and low residual phase noise ($<-155dBc/Hz$ at 100kHz and above) which make it suitable as an active balun/buffer amplifier between LO and balanced mixer for base station receiver applications.